

Marked-up Version of Claims

1). (Amended) A plurality of unleaded fuels boiling in the gasoline range [for use in spark ignition, internal combustion engine having a CR of 11 or more] comprising:

at least a first fuel and a second fuel[,]
operable in a spark ignition, internal combustion engine having a compression ratio, CR, of 11 or more,

the first fuel having a research octane number RON₁ greater than 100, and at high load conditions an average burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane[;]

[the second fuel operative in said engine].

2). (Amended) A plurality of unleaded fuels boiling in the gasoline range [for use in a spark ignition, internal combustion engine having a CR of 11 or more] comprising:

at least a first fuel [operative in said engine,] and a second fuel[,]
operable in a spark ignition, internal combustion engine having a compression ratio, CR, of 11 or more,

the second fuel having a research octane number, RON₁, less than 90, and at low load conditions a burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane.

3). (Amended) A plurality of unleaded fuels boiling in the gasoline range [for use in operating a spark ignition, internal combustion engine having a CR of 11 or more] comprising:

at least a first fuel and a second fuel[,]
operable in a spark ignition, internal combustion engine having a compression ratio, CR, of 11 or more,

the first fuel having a research octane number, RON, greater than 100, and at high load conditions an average burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane;

the second fuel having a research octane number, RON, less than 90, and at low load conditions a burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane.

4). (Amended) The fuels of claim [1] 3 including at least a third fuel having a research octane number, RON, between those of the first and second fuel, and at medium load conditions a burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane.

6.) (Amended) The fuels of claim 5 wherein the admixture functions to allow engine operation at or about minimum spark advance for best torque, MBT.

7.) (Amended) The fuels of claim 4 wherein the third fuel functions to allow engine operation at or about minimum spark advance for best torque, MBT.

8). (Amended) At least two unleaded fuel compositions boiling in the gasoline range [for use in operating a spark ignition, internal combustion engine having a CR of 11 or more] comprising: at least a first fuel and a second [fuel boiling in the gasoline range,]
operable in a spark ignition, internal combustion engine having a compression ratio of 11 or more,
the first fuel having a research octane ratio, RON, greater than 100 and greater than 45 vol. aromatics, the second fuel having a research octane ratio, RON, and aromatics less than the first fuel.

9). (Amended) The fuel compositions of claim 8 wherein said first fuel has greater than about 55 vol% aromatics.

10). (Amended) The fuel composition of claim 9 wherein said first fuel has about 60 vol% aromatics.

12). (Amended) The fuel composition of claim 11 wherein the concentration of sulfur in the [low RON] second fuel is lower than the concentration of sulfur in the [high octane] first fuel.

Clean Version of Claims

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1). (Amended) A plurality of unleaded fuels boiling in the gasoline range comprising:

at least a first fuel and a second fuel operable in a spark ignition, internal combustion engine having a compression ratio, CR, of 11 or more,

the first fuel having a research octane number RON₁ greater than 100, and at high load conditions an average burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane.

2). (Amended) A plurality of unleaded fuels boiling in the gasoline range comprising:

at least a first fuel and a second fuel operable in a spark ignition, internal combustion engine having a compression ratio, CR, of 11 or more,

the second fuel having a research octane number, RON, less than 90, and at low load conditions a burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane.

3). (Amended) A plurality of unleaded fuels boiling in the gasoline range comprising:

at least a first fuel and a second fuel operable in a spark ignition, internal combustion engine having a compression ratio, CR, of 11 or more,

the first fuel having a research octane number, RON, greater than 100, and at high load conditions an average burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane;

the second fuel having a research octane number, RON, less than 90, and at low load conditions a burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane.

B3 4). (Amended) The fuels of claim 3 including at least a third fuel having a research octane number, RON, between those of the first and second fuel, and at medium load conditions a burn rate greater than 105% of isooctane and a laminar flame speed greater than 105% of isooctane.

6.) (Amended) The fuels of claim 5 wherein the admixture functions to allow engine operation at or about minimum spark advance for best torque, MBT.

7.) (Amended) The fuels of claim 4 wherein the third fuel functions to allow engine operation at or about minimum spark advance for best torque, MBT.

B4 8). (Amended) At least two unleaded fuel compositions boiling in the gasoline range comprising: at least a first fuel and a second operable in a spark ignition, internal combustion engine having a compression ratio of 11 or more, the first fuel having a research octane ratio, RON, greater than 100 and greater than 45 vol. aromatics, the second fuel having a research octane ratio, RON, and aromatics less than the first fuel.

9). (Amended) The fuel compositions of claim 8 wherein said first fuel has greater than about 55 vol% aromatics.

10). (Amended) The fuel composition of claim 9 wherein said first fuel has about 60 vol% aromatics.

12). (Amended) The fuel composition of claim 11 wherein the
concentration of sulfur in the second fuel is lower than the concentration of sulfur in the
first fuel.

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Flame Speed vs RON for Various Hydrocarbons

